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The Dynamics of Household Consumption in Romania during Economic Crisis

Cornelia Scutaru[a,b,c]*, Corina Saman [a,b], Bianca Pauna [b]

[a]*Institute for Economic Forecasting, NIER, Romanian Academy, Calea 13 Septembrie, Bucharest, Romania*
[b]*Center forMacroeconomic Modelling, NIER, Romanian Academy, Calea 13 Septembrie,Bucharest, Romania*
[c]*Academy of Romanian Scientist, Romania*

Abstract

In this paper we analyze the correlation between household consumption and the main factors that act in this area using Error Correction mechanism. The dynamics of the consumption data and its main determinants reveals a period of about one year (2009) in which the shock of the economic crisis were strongly felt, followed by a period of policy designed to counter its effects. The lengthening of the economic crisis does not allow a return to a period of real consumption growth, only the ending of the negative developments. However the short-term dynamic equation indicates the possibility of a quick convergence toward the long-term equilibrium.

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1. Introduction

The present paper is a part of a larger study that aims at developing a quarterly model based on demand (internal / external) model that allows both the analysis and the forecast of the evolution of Romanian economy in conditions

* Corresponding author.
E-mail address: corneliascutaru@yahoo.com

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of prolonged economic crisis. The model will include several behavioral equations grouped into two blocks: • Domestic demand; • Foreign trade.

The data used are quarterly statistical series, covering the period (1998) 2000-2013, obtained directly from the official statistics (EUROSTAT, NBR INS) or computed from data series using specific keys. Where appropriate the series were seasonally adjusted with the Tramo/Seats procedure, enabling the reconstruction of the forecast for the seasonally series. In some cases, the variables analyzed in order to understand their evolution are expressed in nominal terms, but all the series used to build equations are expressed in real terms.

We limit analysis to the period (1998) 2000-2013 since the previous period (1991-2013) includes the period of transition to a market economy, during which the monetary policies have sustained different shocks. Even if there is not a clear demarcation of the end of the transition phase, the period 1998-2000 brings a certain stability in key macroeconomic policy, at least until the beginning of the economic crisis (2008-2009), when there are other shocks in the behavior of economic agents, due to weaker economic activity, due to the reorientation of markets, due to the macroeconomic policies design in order to speed the economic recovery. The global economic crisis led to structural and growth changes with impact on all components of both demand and supply.

In this paper we discussed household consumption and the impact of the economic crisis on the household consumption as an important part of the domestic demand. In the first part we analyzed the evolution of household consumption and of its main determinants, and in the second part we showed the behavioral equations of the model. We built error correction equations, which contain a "mechanism for error correction" based on a co-integration relationship between the non-stationary variables which are I(1). We estimate in the beginning the long-term cointegration equation, followed by the short-term dynamic equation, which includes as an error correction term the residuals from the long-term equation. The coefficient of this term measures the speed of adjustment towards the long-term equilibrium.

2. Literature Review

Aggregate household consumption measured by expenditure accounts reflect the living standards so it is not expected to present large variability in the short-run unless some major economic events. In Romania as in many other countries the financial crises leads to important decrease in consumption so it is important to detect the determinants of the phenomenon.

The private demand representing more than 55% of Romanian aggregate demand has to be stimulated through the right economic policies in order to achieve economic growth especially in times of crises (Pelinescu 2012).

Some explanations for the depressed consumption may be found in the permanent income theory (Friedman 1957), in precautionary or buffer-stock savings hypothesis (e.g. Carroll and Toche 2009, Carroll and Kimball 2001, Caroll 1997, Deaton 1991) or in the fallen of the credit due to financial crisis.

Gerlach-Kristen, O'Connell and O'Toole (2013) using an error-correction model examine macroeconomic data in 23 countries (1981:Q1-2011:Q4) and assess the impact of financial crises on aggregate consumption. The paper show there exists a long-run relationship between consumption, income, housing, and other wealth and that in the short-run a drop in income reduces consumption.

Using a VAR approach Jaewoo Lee, Pau Rabanal, and Damiano Sandri (2010) found that U.S. household consumption declined sharply in late 2008 and compared to the pre-crisis years changes in saving and consumption imply a decrease in the U.S. private-sector demand of 2–3¾ percentage points of GDP.

Dobrescu (2013) in his macro model of the Romanian economy estimate the households' consumption (market and non-market) as a function of income, interest rate, and the share of the rural population.

Borsch, (2013) shows that during the recession the private consumption in Eurozone followed the development of disposable income except for Spain where consumption recovered and grew in spite of continuously declines of the income. The identified cause is that households are strongly pessimistic about their financial prospects.

3. The Dynamics of Household Consumption and its Main Determinants

3.1. Household Consumption

Judging from the dynamics of the seasonally adjusted series (**Error! Reference source not found.**) of household consumption (volume, million USD, reference year 2005), the sharp drop in household consumption begins in the last quarter of 2008 and first quarter 2009. Household consumption remains at a relatively low level until the fourth quarter of 2010, when the first signs of recovery, with consumptions reaching the 2007 level, can be observed. We cannot speak of an upward trend, equivalent to an end of the economic crisis, but of a stop in the decline in consumption.

The results of simulations for 2013-2014 from Dobrescu (2013) indicate a slight growth of consumption in 2012 and a minimal but negative growth in 2013 (index of households consumption, constant prices (previous year=1) 1.006283 in 2012 and 0.99653 in 2013), which is consistent with the stabilization of household consumption after the crisis.

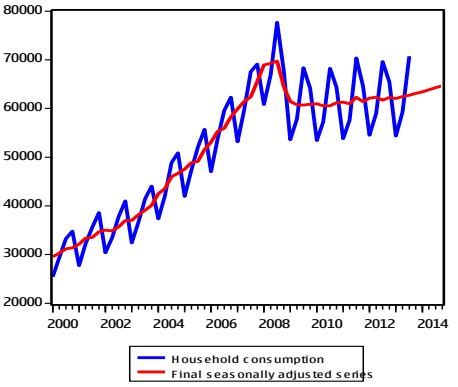

Fig.1. Dynamics of the household consumption (mil. LEI)

Household consumption is the main category of expenditure, representing 55.2% and 77.7% of the GDP (seasonally adjusted series). It is determined by disposable income. In terms of consumption, there are two types of households: those who consume their entire disposable income (including consumer loans obtained), and those who save a proportion of their income, increasing therefore their potential consumption in the future. As income sources we consider wages, pensions, various types of benefits, including unemployment, health insurance spending budget as well as interest income on household's saving deposits (information available from 2007 onwards). Also, loans to households are considered sources of income (also available starting with 2007). For example using a SVAR on quarterly data before crisis (200q1-2008q3) about Romanian economy Pelinescu (2012) shows the negative effect of a positive shock in interest rate on the aggregate demand highlighting the importance of stimulating demand through interest rate channel.

All these sources of income are considered in the short-term dynamic equation. We have no available data for property income (rents, rents, dividends, etc.) so we don' include these indicators in the estimations.

3.2. Income

In nominal terms, wages had experienced the economic crisis since the first quarter of 2009 to the last quarter of 2010, when it resumed the growth trend (Figure 2).

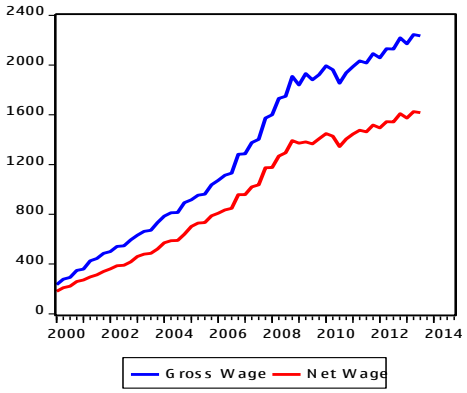

Fig. 2. The dynamics of the quarterly net average gross wage (LEI / person)

In the same period there is a restriction of the economic activity, both private and public, evidenced by the sharp drop in the number of employees, which resulted in increased unemployment whose recovery begins late in the first quarter of 2011 (Figure 3). The decrease in the number of employees has resulted not only in decreased wage revenues, but decreased budget revenues from the social contributions.

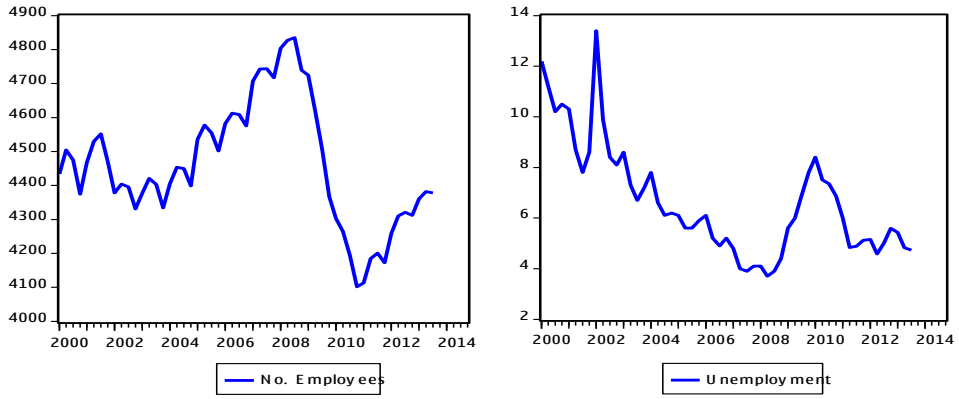

Figure 3. The dynamics of the number of employees in the economy (thou.) and of the unemployment rate (%)
Source: Eurostat data and Monthly Bulletin NBR

For the poor a major source of income, fully utilized in consumption, is the different types of benefits and social assistance. We included in our analysis not only pensions and social benefits, unemployment benefits, but health insurance spending from the budget as well, to capture as large a part as budgetary contributions to household income. In the Figure 4, SAB represents the state social insurance budget expenditures and the SECB includes all types of social expenditures of the general government. Although revenues were affected by lower economic activity during the peak of the crisis, the social budget expenditure has maintained a rising trend, due to the increased number of people depending on them.

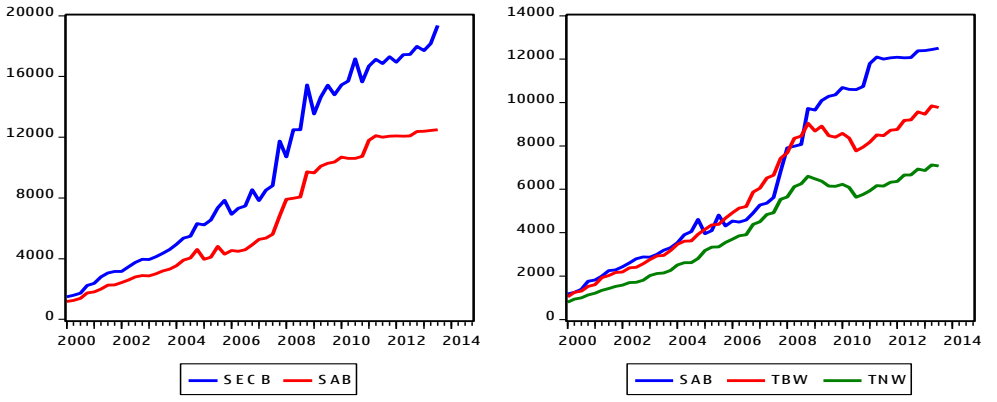

Fig.4. The dynamics of the social security budget expenditure (mill. Lei). AND
The evolution of the social security spending compared to total wages (gross and net).
Source: RNB's monthly bulletins

In the entire analyzed interval, the budgetary social assistance expenditure (SAB) exceeded the total net wages (TNW) earned in the economy, being generally around the overall level of gross wages (TBW). Starting from the fourth quarter of 2008, the expenditure of the social assistance quickly exceeds total gross wages paid in the economy. These are a serious burden on the general consolidated budget expenditures, which increase the deficit.

Loans to the households play an important role as a source of income allocated to consumption. The statistics on loans and deposits are not available before the first quarter of 2007, it is computed in nominal terms. There is an increase trend in 2007, followed by stagnation in the immediate period (Figure 5), when wages become uncertain in a society threatened by rising unemployment and lower incomes. Significant is the evolution of the quarterly growth rate of loans to households, whose oscillations around zero indicate a state of confusion regarding the demand of loans from the population.

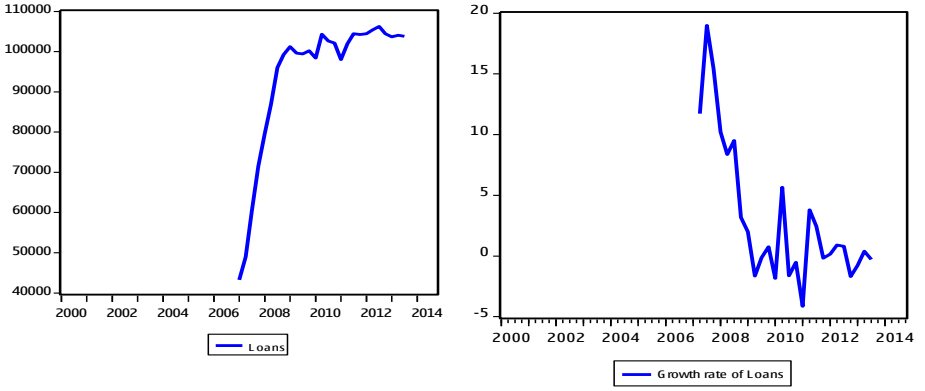

Fig. 5. The dynamics of the household loans (mill. Lei) and the quarterly growth rate of loans to households (%)
Source: RNB's monthly bulletins

The households who save during a month, and create deposits in the banks that allow them to maintain / increase consumption, the potential future interest on these deposits can be a source of income for current consumption. The beginning of the crisis occurred in the third and fourth quarter of 2009 manifested with a sharp drop in the level of these deposits, due to the decrease in total revenues. As indicated by the evolution of the growth rate from the previous period of household deposits at the end of 2013 (figure 6), the recovery is still far away, still keeping negative rate.

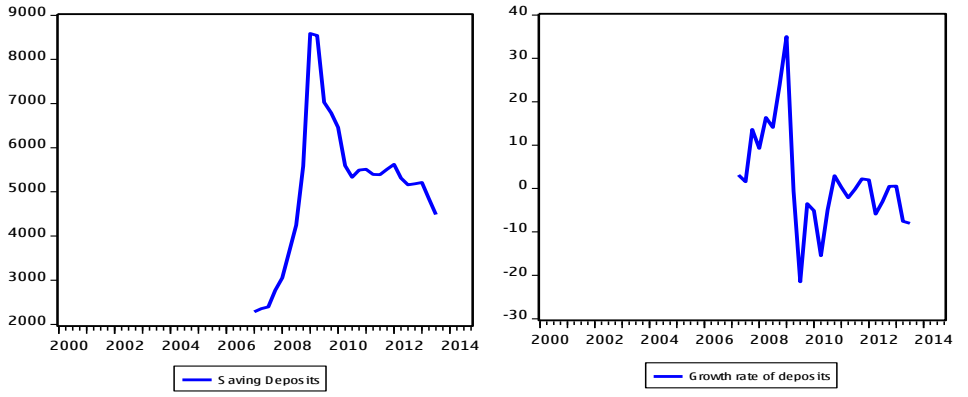

Fig.6. The dynamic of the long-tern savings deposits (mil. Lei) and the quarterly growth rate of household saving deposits (%)
Source: RNB's Monthly bulletins

The dynamics of the consumption data series and its main determinants reveal a period of about one year (2009) in which the shock of the economic crisis was strongly felt, followed by a period in which the economic policy measures to counteract the effects were in place. The lengthening of the crisis does not allow for a return to real growth in consumption, but only a stopping of the negative developments. All analyzes reveal salaries as the main factor in the recovery of consumption, so increasing the number of employees and a reduction in the number of unemployed by creating new jobs should be a priority in all approaches to macroeconomic policy. Of course, this requires increasing investment and the development of the production sector. An analysis of these factors is the subject we will address below. If employment (associated with an increased number of employees, reduce unemployment and wage payments return to a reasonable level) reacted quite quickly after the shock of 2008-2009, the largest inertia can be found in the banking system: the evolution of both households credits and deposits has growth rates either low or even negative throughout the period following the initial shock of the economic crisis (2010-2013).

4. Behavior Equations

ECM procedure - error correction model - starts with estimating an equation for the long term relationship, followed by a dynamic equation for the short term. In the long-term equation variables must be integrated of order one and there must be at least one co-integration relationship. The equation includes the so-called short-term error correction term, which can be regarded as the difference between the current equilibrium and the long-term equilibrium level of the dependent variable. This deviation or "error" will be partially adjusted in the next period as the correcting variable has the effect of increasing (or decreasing) the percentage change of the dependent variable. So the error correction variable is the residual term of the long-term equation. The coefficient of this variable indicates the adjustment speed at which the current level of the variable self-adjust to the long-term equilibrium level. The closer to zero (to unity) is this coefficient; the longer (or shorter) is the process of adjustment.

In **the long term** we estimated an equation in which household consumption (in real terms) depends on the total net wages paid in the economy, taxes paid and total social spending budget. Variables are integrated of order 1 and there is at least one co-integrating equation, according to Johansen co-integration test. The variables are expressed in logarithms.

The estimated equation:

Consumption = **3.2478 +0.7578* TotalNetWages - 0.0921*Taxes(-1) + 0.2273* SocialSecurity**

The long-term elasticity of household consumption with respect to the net wage is 0.76 and 0.23 relative to income from the social assistance, which indicates a high dependency of consumption especially in relation to income from net wages. Not negligible, however, is the revenue contribution from various social budget spending (pensions, allowances, unemployment benefits, health insurance costs, etc.) the long-term elasticity of consumption to the level of taxes is negative and relatively low, at -0.09, indicating a poor response of consumption to changes in fiscal policy.

The **short-term dynamic equation** reflects the heterogeneity of household consumption. There are two types of consumers: those who look to the future and their long term behavior can be describe by risk aversion, therefore they save for the future. The second type households are liquidity constrained and consume their entire current income. To express the behavior of both types of households, we included in the short-term dynamic equation, income from interest on deposits of the population (available from 2007). The variables are expressed in difference of logarithms.

The estimated equation (variables are in differences):

Consumption = -0.0489 - 1.1357*Error_correction - 0.8610*Consumption(-1) + 1.8050*TotalNetWages + 0.4684*SocialSecurity(-1)+1.1775*Loans(-1)-0.8110*InterestonDeposits-0.7846*Taxes(-1)

In this equation total net wages, social spending from the budget and household loans positive have positive coefficients (respectively 1.80, 0.47 and 1.18) and the interest on deposits and taxes have negative coefficients (-0.81, -0.78, respectively). In a more detailed analysis, it is clear that the most important determinant of consumption remains net wages and a large part of the population relies on loans. However they do not provide an increase in consumption in comparison to the previous period (the coefficient is -0.86). The risk aversion households that try to protect through savings against future risks does not allow the use of the interest income. The negative coefficient on this variable indicates a tendency to save the interest income rather than or use it in consumption. The threat of a new crisis or the lengthening of the current one can be responsible for this effect. Error correction term indicates a high speed of adjustment towards the long-term equilibrium determined by the same wage and social assistance income. Therefore, the short-term changes within the relationship between the banking system and households (loans and saving deposits) are not influencing the nature of the problem, which is poverty in the great mass of the population.

Applying the tests CUSUM and CUSUM of Squares we test the soundness of the estimated model. It proves the stability of parameters and parameters variance with some minor instability in the period 2010q4-2011q4 when the shock of the financial crisis starts to diminish.

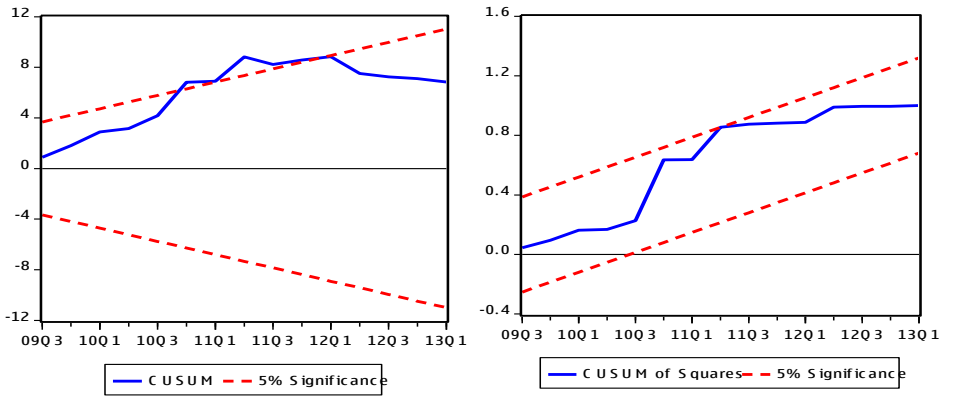

Fig.7. The Stability of parameters from the short-run equation

5. Conclusions

As integral and important part of the domestic demand, household consumption has been on an upward trend interrupted only by the 2008 economic crisis. The decrease in revenues, brought about by the reduction in wages and increasing unemployment, inflation, interest rate on loans marked a period of reduced private consumption. This led, together with the reduction in investment and the restrictions on government consumption, to a sharp decline in the domestic demand.

The dynamics of the consumption data series and its main determinants reveals a period of about one year (2009) in which the shock of the economic crisis were strongly felt, followed by a period of policy designed to counter its effects. The lengthening of the economic crisis does not allow a return to a period of real consumption growth, only the ending of the negative developments. However the short-term dynamic equation indicates the possibility of a quick convergence toward the long-term equilibrium.

Both long-run equilibrium equation and the short-term dynamics highlight the strong dependence of consumption on total wages (net) received by households. Another important factor remains the transfers from the budget (including pension, various allowances, unemployment, health insurance). There are two conclusions: the **first** refers to the overall standard of living of the household which depend essentially on the two types of income, and the **second** refers to design macroeconomic policies to increase employment (stimulating investment and productive activity by sector specific decisions), together with increased wages (the additional budgetary revenues generated by increased wages can be used to finance additional budget social expenditure).

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